1016-65-258 **Anton Leykin***, leykin@math.uic.edu, and **Jan Verschelde**. *Towards a local isolation test.* Preliminary report.

Let $F(x) = 0$ be a polynomial system and x^* its solution. In this talk I will describe how to compute the dimension of the irreducible component of the solution set that contains x^*. In particular, this would answer the question whether x^* is a isolated solution. The approach is based on construction of the Hilbert polynomial for the ideal generated by F in the local ring of x^*.

Numerical stability becomes an issue if only an approximation x_0 of x^* is known. I will discuss how to use numerical rank revealing methods to recover the Hilbert polynomial as well as how to combine this method with deflation in order to refine the initial approximation x_0 *en route*. (Received February 13, 2006)